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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,947	10/23/2003	Benjamin J. Eggleton	37-1-4	6310
7590	04/12/2005			
Wendy W. Koba PO Box 556 Springtown, PA 18081			EXAMINER PAK, SUNG H	
			ART UNIT 2874	PAPER NUMBER

DATE MAILED: 04/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.

10/691,947

Applicant(s)

EGGLETON ET AL.

Examiner

Sung H. Pak

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 9-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 0104.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-8, drawn to a microstructured optical fiber, classified in class 385, subclass 125.
- II. Claims 9-12, drawn to a method of making a microstructured optical fiber, classified in class 65, subclass 385.

The inventions are distinct, each from the other because of the following reasons:

Inventions Group II and Group I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process, such as a process that does not involve slicing and polishing method steps.

Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

During a telephone conversation with Wendy Koba on April 6, 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-8.

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Affirmation of this election must be made by applicant in replying to this Office action. Claims 9-12 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### ***Information Disclosure Statement***

Information disclosure statement filed 1/26/2004 has been considered by the examiner.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Greenaway et al (US 6,301,420 B1).

Greenaway discloses an optical device with all the limitations set forth in the claims, including: a microstructured optical fiber component comprising a first internal portion

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exhibiting a first refractive index (column 1 lines 5-7); a plurality of regions exhibiting various, predetermined refractive indices, the plurality of regions arranged to provide predetermined modifications to an optical signal passing therethrough (column 3 lines 32-34) characterized in that the microstructured optical fiber component is formed to comprise a fiber segment by drawing from a preform of similar pattern (column 3 lines 35-41) and is defined by a pair of endfaces with a height (inherent characteristics of a finished optical fiber, see Fig. 5-6) such that the endfaces do not significantly affect the behavior of the light passing therethrough in a direction parallel to the endfaces (column 5 lines 22-45: Because of highly accurate and precise geometrical arrangement of fiber components, the endfaces maintain the exact same geometrical configuration as the rest of the fiber. Therefore, the fiber end faces that do not change the behavior of light passing through the fiber in the direction parallel to the endfaces);

wherein the fiber segment comprises at least one aperture formed through the vertical extent thereof, said at least one aperture filled with gas, liquid or solid (column 4 lines 15-19);

wherein one or more optical elements are disposed within the at least one cylindrical aperture (column 4 lines 15-19);

wherein plurality of solid plugs are disposed within at least one aperture (column 4 lines 19-21: i.e. partially filled with solid material);

wherein one or more micro-fluidic plugs of material with a known refractive index is inserted in at least one aperture (column 4 lines 19-22: i.e. partially filled with liquid material);

wherein one or more microstructures are formed through at least a portion of the vertical extent of the fiber segment (column 4 lines 5-6: air-filled holes are formed through the entire portion of the vertical extent of the fiber segment).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greenaway et al (US 6,301,420 B1) in view of Koops et al (US 6,075,915).

Greenaway discloses an optical device with all the limitations set forth in the claims as discussed above, except it does not explicitly teach the use of plurality of etched cylindrical elements formed to be parallel to the endfaces of the fiber.

On the other hand, the use of plurality of etched cylindrical elements formed to be parallel to the endfaces of an optical fiber is known in the art, for example, as taught by Koops (Fig. 1). Koops teaches that forming such structures on the fiber is advantageous and desirable

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over the prior art, because it allows for extremely small optical signal processing component that does not need high accuracy coupling with signal transmitting optical fibers (column1 lines 11-41).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Greenaway device to have plurality of etched cylindrical elements formed to be parallel to the endfaces of the fiber as claimed in the instant application.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Greenaway et al (US 6,301,420 B1) in view of Patlakh et al (US 2003/0231845 A1).

Greenaway discloses an optical device with all the limitations set forth in the claims as discussed above, except it does not explicitly teach the sidewalls of the fiber segment being tapered at the endfaces.

On the other hand, photonic crystal fibers having laterally tapered end portions are known in the art, for example, as taught by Patlakh (see especially Fig. 14). Tapered end portions in photonic crystal fibers are commonly known to be advantageous and desirable in the art, because the tapering allows for solids or liquids disposed within the vertical apertures to remain in the apertures during the fiber use. Thus, the use of tapered end portions allow for more robust fiber applications. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Greenaway device to have optical fibers with tapered end portions as claimed in the instant application.

It is noted that claim 8 recites a functional limitation, "... to alter the lateral behavior of an optical signal passing therethrough." Although Patlakh does not explicitly disclose this

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functional limitation, since the combination of Greenaway in view of Patlakh renders all the recited *structural limitations* obvious, the resulting device would inherently "alter the lateral behavior of an optical signal passing therethrough."

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hamada (US 6,798,960 B2) and Walt et al (US 6,667,159 B1) teach microstructured optical fibers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sung H. Pak  
Examiner  
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